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THE NEWSPAPER FOR
THE HOBBYIST OF VINTAGE
ELECTRONICS AND SOUND

THE HORN SPEAKER

THE GOOD OLD DAYS
by Ron Boucher

My own personal collection is quite small. I have five sets in all and I tried to get a good cross section of radios from the 30's. They're all restored and located in various rooms and they are used regularly. There was, however, one type of radio that was not represented in this collection, and that, of course, the battery set of the 1920's.

Well, I decided to rectify that situation, and make my "radio outfit" as authentic as I could, so I set out to gather what I'd need. I found a nice 1925 "Standardyne" set that I thought had the well proportioned look of the typical Bakelite face, 3 dial, TRF of the battery set era. I got out my RCA horn, and that small antique table that I had bought at a yard sale. I set up an antenna in the attic and ran the lead in along with a ground wire to the spot I had chosen as a listening area. I got hold of four twenty two and a half volt batteries and I got out my six volt battery eliminator (I decided to use the eliminator because I didn't feel I needed to be so authentic as to even have old fashioned battery acid holes in my carpet). I took out some unused 201A's and located my old Sears Roebuck "B" battery meter. Right about then it occured to me that people in the 20's must have really loved music to go through all this trouble and expense to get a radio outfit in their home.

I put everything together near an easy chair in front of our fireplace; also I had a 1920 style lamp, complete with fringe around the lamp shade, all of which I sat up behind the chair. I even dug up my old smoking pipe. Did you ever notice that when you look at a 1920 radio ad of a man listening to a radio, he is usually smoking a pipe?

So, here I was ready to go, but I needed something to christen this outfit, and listening to the top 10 on the local disco station just didn't quality. This all took place in late October, so I decided that the election coming up would make for interesting listening, and what is more, since I'm just within range of KDKA in Pittburgh, I could recreate that first broadcast way back in 1920, which most people regard as day 1 in radio broadcasting.

Well, that is just what I did, and I must say that I really enjoyed it. Just about the time that the President was making his concession speech I noticed that I was beginning to draw a crowd and I had the whole family gathered around the wireless. And to think that we were listening to history in the making and not some recording. What more could I ask for?

A few months later, one evening, I was reading Morgan McMahon's FLICK OF THE SWITCH, and I was into chapter 3, where the author describes a scene in which a family is seated around their radio in the living room, and they are listening to their favorite radio program. Right then I looked up from my book, and there, in my own living room was my family seated around the television watchin their favorite television program. Substitute the word television for the word radio in the book, and I had the same scene taking place right in front of me. So, I just put down my books and went into the living room to take it all in. It's true that with television you can't use your imagination as much as radio but after all the same thing can be said about radio; because with radio you can't use your imagination as much as reading a story in a book.

I began thinking about other similarities between today and the early days of radio and one thing that came to my mind was the CB craze of 4 or 5 years ago. I'm sure that anyone who took part in that craze, can see the similarity between it and the radio boom of the early 20's. Discussions among enthusiasts centered around who was erecting the best antennas, who had the best radio and who could get the most range. There was such a fascination with CB radio that nobody dared to speak plain English on their transceivers and if you didn't talk CB slang you were doing something wrong. There were many companies that got into the radio business then, trying to cash in on the fad. Not too many were in business a few years later-- just as in the 20's.

Well, after having spent so much time trying to recreate the feeling of radio in the old days I realized that this feeling was still around today in other things. I'm sure that the people listening to the Aldrich Family in the 30's were no more aware of their future place in history than someone watching

Archie Bunker's television plays today. And the people who were engaged in the radio manufacturing during the early days were no more aware of the significance of their work than someone let's say, in the home computer industry of today.

I was in a department store a while back and while I was standing in the check out line, I could see the display of radios, stereos and tape players covering an entire wall. I just imagined a collector of the future, wishing he could go back in his past to be standing in the same spot I am standing and seeing what I was viewing.

However, I have decided not to spend too much time dreaming about the past, because I might miss too much of what is going on right now. After all that collector of the future may some day ask you what it was like in the early days of the computer age and if I pay a lot of attention of what is happening today, I will be able to help him.

letters

Dear Jim:

I have learned that very few technicans can or will rewind audio transformers; I have the facilities to do the job, hence the ad.

Very few audio transformers are burned out. The main problem is the fact that very early solder fluxes contained some acid. Through the years the acid eats away the fine wire at the soldered lead. The transformer has to be rewound, because you can't get at the inside layers to resolder the lead.

Sincerely,
Richard Ray
423 Orchard
Canon City, CO
81212

Dear Jim:

Enclosed is a check for $100.00 for two full-page ads in THE HORN SPEAKER, artwork to follow. We have decided to continue the printing of Vintage Radio books, at least for 1981. This should be good news for your readers, especially those who have not been able to get copies of the RADIO COLLECTOR'S GUIDE.

Two hundred copies of RADIO COLLECTOR'S GUIDE have been released for distribution, and are available from McMahon Vintage Radio, Box 1331, North Highlands CA 95660. Price is $9.95, plus $.50 handling and postage.

Printing, operating and postage costs have zoomed since our last price setting in 1977. For this reason, our prices will increase as of April 1, 1981.

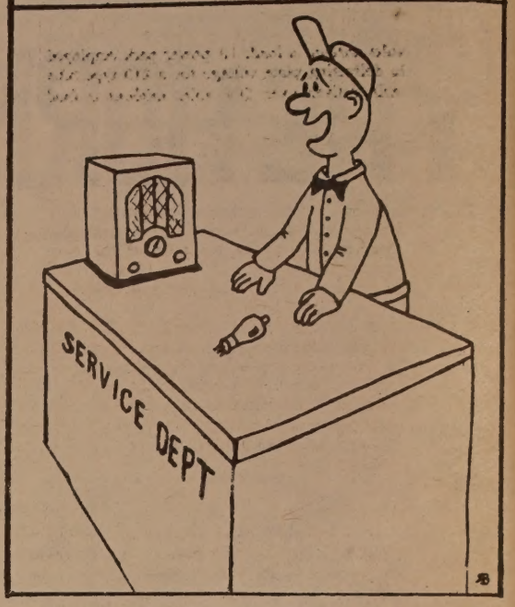
Very best regards,
Morgan E. McMahon

Dear Jim:

Please renew me for 2 years. I really enjoy your publication and look forward to its arrival. My speciality is jukeboxes (I own a store restoring & selling them here) but I really enjoy radios and phonographs as well. Thanks for an interesting publication.

William F. Carr
1457 W. Grand Ave.
Pomona, CA 91766

SHOP TALK



AUDIO TRANSFORMER REPAIR

by Ron Boucher

If you are a battery set collector you have, no doubt, found quite a few radios that had defective audio transformers. There is a way to repair these transformers, with which I have had about a 75% success rate. Most of you probably already have used this technique but since I have not seen it described in any of the antique radio periodicals that I read lately; I will give the information here on how to do it. Maybe some of the newer collectors are not familar with this audio transformer repair technique.

I first saw this method of repair in Gernback's RADIO SERVICE MAN'S HANDYBOOK and the following paragraphs are excerpts from the transformer repair article, which was written by Bertram M. Fred. He suggests using the power supply of an A.C. set, but it may be more convenient to use a "B" battery eliminator.

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With the many A.C. sets now manufactured it is an easy task to repair audio transformers and even filter chokes, in the home of the customer without the aid of external means. Most A.C. sets use power tubes requiring at least 180 volts on the plate. The power pack of such a set usually delivers 300 volts *without a load*. A power pack employed in delivering plate voltage for a 210 type tube will deliver over 300 volts *without a load* It is with this "open circuit" voltage that we repair transformers and chokes.

Quick Field Repairs

Bring out leads from the negative and high-voltage leads of the pack and apply them directly to the terminals of the open transformer primary (Bear in mind that the pack must be operating *without a load* to secure the higher voltage.) After five seconds, remove voltage and test. If winding is not closed, repeat procedure applying voltage for a longer period until winding is closed. The same method is used with the secondaries of A.F. transformers (only apply voltage for a second or two as this winding can be burned out very easily).

When a transformer is found with primary shorted to secondary apply voltage to one side of secondary and one side of primary, Fig. 3. Very often, the short is cleared by the breakdown of the turn or turns of wire that are shorting.

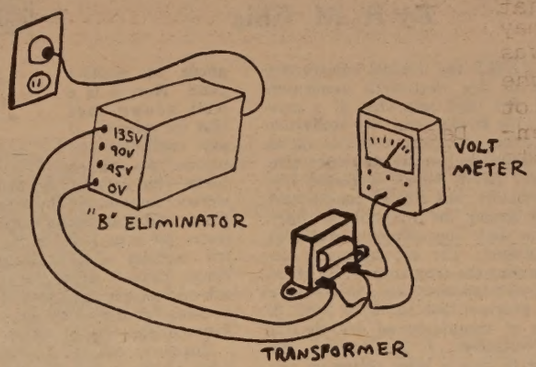
A filter choke or field coil of a dynamic speaker, though usually requiring a greater voltage to "heal" it than that under which it operates, has been repaired with only the voltage of the power pack in which it was working.

Perhaps an explanation of this "healing" process will be of moment. When voltage is applied to an open winding, an arc occurs at the open, burning the insulation from adjoining turns, recreating a continuous winding.

What is necessary to repair A.F. transformers, filter chokes and field coils is voltage several times greater than that under which the apparatus is operating. An A.F. transformer primary usually operates at 45 to 180 volts; in most cases 300 volts is sufficient to close any open A.F. transformer primary. A filter choke usually passes the entire output of a power pack; therefore a higher voltage is necessary to "heal" the open.

The author suggests you apply the voltage for a specific amount of time, however, I prefer monitoring what is going on in the transformer, so that I know when the transformer is healed and I can remove the voltage. This I do by putting a D.C. voltmeter accross the transformer terminals, because when the transformer is repaired and starts to conduct again, the voltage accross the terminals drops substantially and I then remove the voltage.

The setup is illustrated below for you.



I would not recommend using the modern solid state eliminators as they probably do not have a high enough current rating and may be damaged.

Turn your accumulated sets into a silver mine. These sets have value.

By returning sets promptly and legally moving to possess and re-sell "orphaned" radios, you will keep your floor and shelf space clean and pave your cash register with a continuous flow of silver.

When Is a Set Obsolete?

Being of part Irish ancestry, and possessed of a normally sunny disposition, we do not intentionally pick fights—either verbal or otherwise—but we do not dodge them when the occasion demands. Thus, when a good customer of ours asks the question, "is my set obsolete?" we hitch up our britches and tell him the truth. While our method of arriving at an answer to this question may not suit the most discriminating, it satisfies us.

We look at the set, get down the manuals, if in doubt, and look for an avc circuit. Finding none, we turn our left thumb outward and downward, while delicately holding our nose between right thumb and first finger. The customer usually gets the point at once, but often not without further discussion. We gently explain to him that his kitchen cabinet was built previous to 1930 and while it set him back two years financially, it has paid for its costs time and again in educational and entertainment value. We further wise-up our customer to the fact that a set without avc is like a car without brakes and, using this as a starting point, we soar into a snap-explanation of avc action which leaves us both slug-happy. We also slyly introduce the idea that a repair of his set will be fairly expensive and make a mental note to add $5 to the bill. If this is to no avail, we give him an estimate which clinches the argument.

As you can no doubt see, we do not like to repair old sets. We have reasons. Aside from the pleasant facts that they are easier to repair and command a better repair bill, we have found ample reasons to shy clear of them. First, and foremost, they often refuse to stay fixed for any length of time. They are like the one-horse shay which, when it finally fell apart, did a good job of it. Second, the correct replacement parts are often hard to obtain. Third, when a set of this vintage is finally fixed, the owner still hasn't anything which even faintly resembles a modern radio. Fourth, an honest repair (not a patch-up) calls for a bill, the payment of which would go quite a ways toward the purchase of a new radio. Fifth, we don't like to see people throw away money without a reasonable return. Sixth, we don't like the idea of, as one serviceman phrased it, "being married" to a flock of superannuated radios.

There are those intrepid souls who suggest messing around inside the set and adding avc, tuning indicators and a set of two-toned horns. There are also those who recommend jerking out the old set and replacing it with a new chassis. Personally, we always suggest to our customers the delightful and soul-satisfying idea of using the cabinet *sans* chassis as a living room bar.

on the air

RADIO NEWS April, 1941

by SAMUEL C. MILBOURNE
Serviceman, Greenwood, Miss.

WE visit few radio repair shops that do not have their walls lined with an odd assortment of old radios which have accumulated because their original owners fail to un-hock them. Often these radios lie de-gutted in dark corners, with their innards brazenly displayed to the world and the holes in their empty cabinets resembling smirking skulls.

The problem of how to dispose of them is an ever-growing one. We give you the results of our experience for what ever help it may be.

First, we don't let them accumulate. So many servicemen will not return radio receivers to their owners until the irate fellows threaten to "have the law" on them. It makes no difference whether the repair has been made, or an estimate has been turned down and the serviceman must return the set unrepaired. The primary rule to which every serviceman should subscribe is GET THAT SET IN AND OUT OF YOUR SHOP AS FAST AS POSSIBLE. If a repair is authorized, no money can be collected until the set has been returned. If the decision is hanging in the air, you can't make the repair until you get the green light. If its a "return unrepaired" job, the sooner you get the set out of your shop the better. If you have a fire, or accidently damage it, you are liable.

There are many cases where, because of one thing or another, the set can't be returned. The customer moves away, or he tells the serviceman he can keep the old set, or the customer disappears and does not return to claim the set. In such cases, we suggest that you look up the law pertaining to your responsibility for the set. In some states you can sell the set in 30, 60 or 90 days if it is not claimed, provided you have a sign to that effect in your shop. In any case, once you have a *legal* right to dispose of the set, we suggest that it be examined and a *cost* estimate made to determine whether it can be repaired at a reasonable cost to you. If so, repair it and sell it *for the normal repair charge you would have received on it* plus any advertising or selling cost you might incur. If not, deposit it gently in the ash can and forget it.

In this locality, the sale of second-hand sets to the poorer people is a profitable side-line. Get a down payment of one or two dollars and arrange weekly payments of 50c or $1.00. If you can get about a dozen of these weekly accounts on your books, they provide some welcome additional pin-money. Often you can gradually build a customer up through a series of trades from a small receiver to a console model. Here is where so-called *Yankee* trading blood will tell.

A local cabinet maker specializes in this cabinet wizardy and the lining can also be obtained despite Mississippi's loyalty to the cause of prohibition. Thus, we send our customers on their way rejoicing with the name of a dealer who will sell them, for a consideration, a real radio—and who is our very dear friend.

A Plea for Standard Radio Terms and Spelling

One of the "little" things which "gripe" this writer is the non-standard radio terminology and spelling.

For instance. Take the term used to describe the poor but honest toiler in a radio repair shop. Omitting some of the terms affectionately (?) bestowed upon him by irate customers, we have *serviceman, service man, radioman, radio man, radio mechanic, radiotrician, radio engineer, radio specialist,* etc. There are probably a few others, but we forget them for the present.

Then there is the perennial battle of the *oscilloscopes* and the *oscillographs.* Which term is the more correct? Getting further into test instrument terminology, we find *set tester, analyzer, multimeter* and a variety of terms using "plug-in" or "plug-and-cable" to describe multi-range meters. Sometimes it is hard to determine whether the instrument has or does not have a "harness" attachment for plugging into radio sockets.

Going into the matter of "meters," we find that the manufacturers of "meters" call them *indicating instruments* not *meters,* because a "meter" to them is an indicating device with some method of recording, such as a light meter which is employed to record current consumed by a user.

Is the little device which "isn't a firecracker in a carload" a *condenser* or a *capacitor?*

Coming to those radio items which are made up mostly of wire, we find that they are called *inductors, coils, chokes* or *transformers,* depending to a small extent upon their use, but to a larger extent upon individual terminology. When we study the various forms of terms used to describe the lowly *intermediate-frequency transformer,* we run into a welter of differences in the abbreviation of the adjectives. *IF, if, i.f., I.F., I-F, i-f,* give you just a few samples. The same applies to the words "radio frequency" and "audio frequency" when they are used as adjectives.

Then there are the same differences when "direct current" or "alternating current" are abbreviated. *D.C., d.c., D-C, d-c,* etc. The same variation for a.c. The prize, to our way of thinking is the term "A.C. Current"—which, when un-abbreviated, reads "Alternating Current Current." We aren't too happy about "A.C. Volts" and "D.C. Volts" which, when expanded read "Alternating Current Volts" and "Direct Current Volts."

The above are merely a few of the variations and inconsistencies which keep us awake at nights. No effort will be made to prolong this diatribe (we really do not mean it as such) by kicking around some of the terms for parts (such as *tube, battery, condenser,* etc.) which have no descriptive meaning. Our thought in presenting this to you was to point out that simplification and standardization always is profitable, whether it be in the manufacture of radios, or the terms used by the radio industry. It looks to us as if the RMA and the IRE could spend some profitable time in standardizing the use of radio terms—to a greater extent than heretofore.

Ringing the Bell

April, 1941

What You Should Know About Electrolytic Condensers

By R. M. Ellis

THE LATEST IN ELECTROLYTICS

Illustrating the reduction in size of electrolytic condensers during the past few years. The larger condenser has a capacity of 8 mfd. but the small one consists of two separate 8 mfd. units!

WHILE the internal construction of dry electrolytic condensers has been somewhat of a mystery to the service man, the realization of a number of important developments as evidenced by greatly decreased size, improved power factor, increased life, and reliability, has created considerable interest among the fraternity to learn just how these improvements have been accomplished. The accompanying picture showing the comparative size of old and modern condenser units is indicative of the progress that has been made in the art of manufacturing dry electrolytic condensers. It is therefore our purpose to give a brief review of the operation of dry electrolytic condensers and to explain these development changes.

Electrolytic condensers are made possible by the fact that aluminum and some other metals form an oxide coating which possesses a most unique property known as unilateral conductivity—that is, the property of passing a current of electricity only in one direction when the oxidized plate is placed in a solution containing a suitable electrolyte. The first commercial use of this effect was as a rectifier of alternating current in "A" and "B" eliminators that were on the market in the early days of the industry.

This effect of unilateral conductivity also explains why all electrolytic condensers are polarized and must be connected in the circuit with the polarity as marked or the condenser will short-circuit the line. (In 110 volt d.c. sets protection against this shorting effect can be obtained by using a two-section [common negative] dry electrolytic unit with the two positive leads connected in the circuit and the common negative lead clipped short and left unused.)

The actual cathode or negative plate is not the plain strip of foil which forms the second element of the condensers—it is the electrolyte. The sole purpose of the plain foil is to form a low resistance connection with the electrolyte of the condenser.

Film as Dielectric

The dielectric of an electrolytic condenser—which corresponds to the waxed paper of a paper type condenser, is the sub-microscopic film of oxide on the anode or positive plate. Now it is a well known fact that the capacity of any condenser depends on three things—the area of the plates, the dielectric constant of the separating medium, and the distance by which the plates are separated. Since the dielectric medium of the electrolytic condenser consists of a film of oxide of sub-microscopic thickness, it is easy to account for the vastly improved space factor of this type of construction.

Engineers believed that certain features of the wet type of construction, such as the requirement of mounting in one position and the tendency of electrolyte to escape through the vent, could be overcome. After extended research Mallory engineers developed and pioneered the so-called "dry" form of construction wherein the liquid was replaced with a gauze soaked in a special wet paste solution. This paste is peculiar in that under conditions of high temperature and low humidity it will dry out, while under conditions of low temperature and high humidity the paste will absorb water from the air and creep.

Need for Sealing

Note this carefully—for herein lies one of the chief differences between cheap dry-electrolytic condensers of short life and doubtful performance, and high grade electrolytic condensers of long dependable life and performance as exemplified by the improved construction. Condensers of the better type are *hermetically* sealed. Around each condenser roll is a wrapping of aluminum foil into the ends of which is poured a quantity of high grade sealing compound.

It was discovered early in manufacturing condensers that the plates were extremely sensitive to contamination—the mere touching of the foil with a finger was sufficient to introduce impurities which in time would cause corrosion and destroy the condensers. This led to methods of cleanliness that even a surgical hospital might envy. After the forming of the plates no part of the condenser is ever touched by a human hand. All work is done with rubber or cotton gloves which are washed with distilled water. Over 16,000 pairs of gloves were used during the first six months of 1936 in the Mallory plant.

The larger size electrolytic condensers employ a special high-grade surgical gauze as the plate separator. Standard surgical gauze was found to be unsatisfactory because of the presence of too much chloride, so the gauze used is specially washed for the purpose and is chemically much purer than the gauze used in hospitals.

Gauze as a separator is open to two objections—excessive bulk and non-uniform support of the plate. The first of these objections is obvious—the second is due to the fact that, under normal operation, gas pressures are generated which tend to force the aluminum foil through the pores of the cloth. To prevent this the aluminum foil must be heavier than otherwise would be required.

In the course of further development paper was considered as a possible separator medium. Unfortunately, not only were all available papers unsatisfactory from the standpoint of chemical purity, but also they lacked strength when wet, and had inadequate absorbent power for the electrolyte. Extended research ultimately developed a paper which had all of the desired qualities. Because of the flat smooth surface of the paper a lesser thickness was required.

Etched Foils

And now we come to the most startling of the new developments. Until recently dry-electrolytic condenser plates were formed on smooth polished metal. The area of the metal was exactly equal to the product of the linear dimensions of the plate. Since the capacity of a condenser is controlled by the effective area of the plate a method was sought by Mallory engineers to increase the *effective* area of the plate without increasing the size. The answer was the etched plate construction, wherein rolls of polished aluminum are run through an acid bath to

produce a roughened surface. The polished finish of the aluminum is converted into a fine sandpaper-like surface, which when viewed under a microscope reveals millions of hills and valleys. As a result an etched plate condenser having the same rating as to life and capacity, can be built with only one-fourth the bulk.

At present the final step in dry-electrolytic condenser construction is the introduction of Regenerated Cellulose, a special cellophane of high absorption, absolute chemical purity and uniform texture as a separator medium. Many other improvements have been made and are constantly being made in the chemical composition of the electrolyte, the method of forming plates, etc., with the result that the reliability of the modern dry electrolytic condenser makes it one of the most dependable units of modern radio receiver construction; and secondly, the tremendous reduction of physical size has been accomplished with an actual improvement in condenser performance.

club news

HOUSTON VINTAGE RADIO ASSOCIATION

HVRA SHOW SET FOR MAY 2

The date for the second annual HVRA Show and Auction has been set for Saturday, May 2. It will again be held in the Hermann Brown Auditorium at the Museum of Natural Science building in Hermann Park.

Frank Cooper has volunteered to act as contest chairman and Bill Werzner and Jerry Wallick will be in charge of the auction. Volunteers are needed in every phase of planning and presentation as soon as possible.

A New and "Boomless"

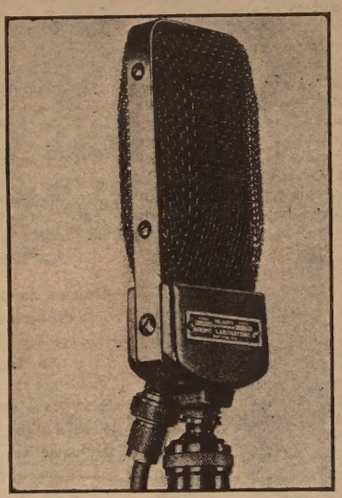
RIBBON MIKE

By John H. Potts

UP to the present time velocity microphones have employed a magnetic field for their operation. Research work by William A. Bruno of the Bruno Laboratories has culminated in the introduction of the Velotron, a new velocity microphone utilizing a static field.

This instrument has decided advantages over many previous velocity microphones. Its output is so much greater (minus 50 db., zero level .006 watts) that one stage less amplification will give equivalent volume. It is a high-impedance type, therefore no transformer is required and one source of trouble due to hum pickup is eliminated. It is highly directional. In tests conducted at the Radio News Laboratories, negligible acoustic feedback occurred even with the microphone but a few inches from the loudspeaker. It can be used for close talking without the usual "boomy" effects present in other velocity microphones with good frequency response.

The design is very simple. As shown in the photograph, eight thin aluminum foil ribbons are placed loosely across a heavily insulated and perforated metallic plate. This metallic plate and the ribbons thus form a condenser which has a normal static capacity of about 500 mmfd. These



ribbons are anchored at each end and the unit is mounted in a protective case.

In operation, a polarizing voltage is applied to the ribbons through a resistance network as shown in Figure 1. Sound vibrations vary the capacity between the ribbons and the fixed plate, causing variations in the minute charging current flowing through R1 and R2. The resulting variations in the voltage drop across R1 provide an electrical replica of the sound frequencies actuating the ribbons. Since the aluminum ribbons are only 2/1000 of an inch thick, they have negligible inertia at sound frequencies.

Increasing the polarizing voltage causes an increase in sensitivity. This occurs because the ribbons are then drawn closer to the fixed metallic plate, and minute sound vibrations cause a greater change in capacity. However, strong low frequency vibrations require a large movement of the ribbons, while high frequency notes require but little. Therefore, increasing the polarizing voltage effectively changes the response curve so as to increase the high-frequency output though the low frequency response is but little affected. This characteristic may be used to advantage in p.a. work.

The polarizing voltage may be taken from any amplifier. There is substantially no current drain and the resistor R2, and condenser C2, provide adequate hum filtration from any rectified power source.

The microphone performed very well in its tests at the Radio News Laoratories. Its relatively low price should prove an additional attraction to workers in the p.a. field.

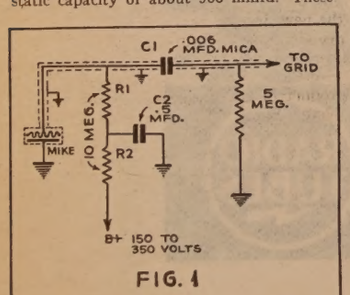


FIG. 1

A RADICALLY NEW PRINCIPLE

Combining the good features of the velocity and electrostatic principles, this microphone provides excellent "quality" with high output, light weight, ruggedness and long life.

376 CILLEY RD.
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REPAIR

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PAUL WHITEMAN solves a mystery

and gives a clue to finer radio music

1 ON THE DANCE FLOOR
OH, MR. WHITEMAN, HOW DIFFERENT YOUR MUSIC SOUNDS —IT WAVERS SO ON MY RADIO
STRANGE— IT MUST BE YOUR RADIO
2
HOW WOULD YOU TWO LIKE TO SEE INSIDE A RADIO STUDIO? I'M GOING OVER IN A FEW MINUTES
OH, HOW THRILLING— I'VE ALWAYS WANTED TO SEE THEM BROADCAST
3 IN RADIO CITY
THESE ARE THE BIG RCA TUBES ALL THE LARGE STATIONS DEPEND ON
AND, OF COURSE, OUR ENGINEERS CHANGE THEM REGULARLY TO INSURE THE VERY CLEAREST TONE
4
AHA—MAYBE THAT'S WHAT YOUR SET NEEDS —NEW TUBES
THAT'S THE ONE THING WE FORGOT. THEY'RE ABOUT A YEAR OLD, I'LL HAVE THEM TESTED FIRST THING
5 A WEEK LATER
OH, MR. WHITEMAN, YOUR MUSIC COMES IN FINE ON OUR RADIO NOW. WE HAVE A NEW SET OF MICRO-SENSITIVE RCA RADIO TUBES
THAT'S GREAT— TELL YOUR FRIENDS ABOUT IT. THEY WANT BETTER RECEPTION, TOO

NEW LIFE FOR OLD RADIOS!

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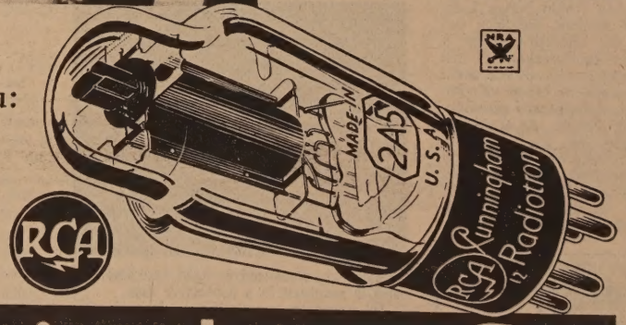


RCA Cunningham Radiotron RADIO TUBES

NEW JERSEY.—PROFESSOR EDISON EXHIBITING THE PHONOGRAPH TO VISITORS, AT HIS LABORATORY, MENLO PARK.

SCIENTIFIC INTELLIGENCE.

Edison's Phonograph.—Mr. Thomas A. Edison, the celebrated electrician, has invented a talking phonograph, which speaks with great clearness and loud enough to be audible at a distance of 175 feet. The speech is also recorded by diagrams on a revolving disk, so that it can be stored up and read at leisure. The instrument is still in its infancy, but bids fair to become a rival of the telephone, particularly as it is self-recording.

THE LATEST SCIENTIFIC WONDER.

EDISON'S SPEAKING PHONOGRAPH.

FOR a year or more the scientific world has been excited from time to time by the discoveries of Thomas A. Edison, who has made electricity a special study. One of his first inventions was the automatic telegraph, which was received as quite a marvel. This he followed in turn with the quadruplex and sextuplex system of telegraphy, the carbon telephone, the stock indicator, the electric pen, the airaphone, and lastly and more wonderful than all the others, the speaking phonograph. Although his discoveries embrace a far greater range of applications and instruments, these are the ones with which the public are best acquainted.

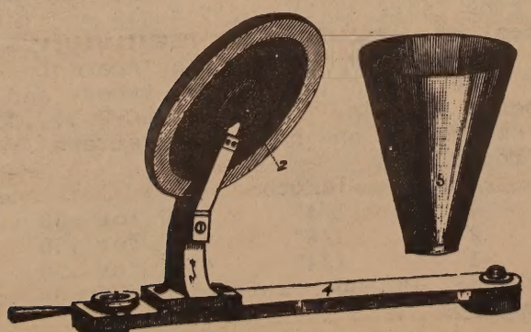
Mr. Edison's workshop is located at Menlo Park, on the line of the New York and Philadelphia Railroad, in New Jersey. The building is a long wooden structure, facing to the east. A dozen telegraph-wires are led into it by sentry-like poles connecting with the main line along the railroad. The front doors open directly into the office. The second story is one room, in which Mr. Edison carries on his experiments. It is an immense laboratory, filled with electrical instruments. A thousand jars of chemicals are ranged against the walls. An open rack, filled with jars of vitriol, stands in the middle of the room. The western end of the apartment is occupied by telephones and other instruments, and there is a small organ in the southwestern corner.

It was here that our artist caught Mr. Edison in the act of completing his improvements on the latest wonder, the speaking phonograph. This is an instrument that will record and reproduce any words or sounds pronounced or made within the proper distance of the mouthpiece of the apparatus. This apparatus is exceedingly simple. It consists of a cylinder four inches in diameter and ten inches long upon a shaft. A spiral groove, like the thread of a screw, is cut in the surface of the cylinder from end to end, and the same kind of a screw is cut in the shaft carrying it. Over this cylinder is secured a sheet of paper or tinfoil. Immediately opposite the cylinder, on an upright arm (4), is a speaking tube, one end of which is closed by a diaphragm (1). In the centre of the diaphragm is a small point (2) like that of a pin, arranged so as to be exactly opposite the grooves upon the cylinder. When the cylinder is set in motion it rotates, and at the same time moves endwise.

Mr. Edison explains very clearly the method of manipulating the phonograph. "This mouthpiece is simply an artificial diaphragm. Turn it over and you see this thin disk of metal at the bottom. Whenever you speak in the mouthpiece the vibrations of your voice jar this disk (3), which, as you see, has in its centre a fine steel point. Now for the other part of the machine. Here is a brass cylinder, grooved something like the spiral part of a screw, only much finer. I wrap a sheet of tinfoil around the cylinder, and shove the mouthpiece up to it so that the tiny steel point touches the tin-foil above one of the grooves. I then turn the cylinder with a crank, and talk into the mouthpiece. The vibrations arouse the disk, and the steel point pricks the tin-foil, leaving perforations resembling the old Morse telegraphic alphabet. They are really stereoscopic views of the voice, recording all that is said, with time and intonations. It is a matrix of the words and voice, and can be used until worn out. Now let us reset the cylinder, so that the steel point may run over the holes or alphabet made when we talked in the mouthpiece. The thin metal disk rises, and, as the steel point trips from perforation to perforation, opening the valves of the diaphragm, the words, intonation and accent are reproduced exactly as spoken through the funnel" (5).

The instrument is so simple in its construction, and its workings so easily understood, that one wonders why it was never before discovered. There is no electricity about it. It can be carried around under a man's arm, and its machinery is not a fiftieth part as intricate as that of a sewing-machine. It records all sounds and noises. Mr. Edison blew in at intervals, and the matrix recorded the sound and returned it. He whistled an air from the "Grande Duchesse," and back it came as clear as a fife, and in perfect time. He rang a small bell in the funnel. The vibrations were recorded, and, on resting the cylinder, the tintinnabulatory sounds poured out soft and mellow. Mr. Edison coughed, sneezed and laughed at the mouthpiece, and the matrix returned the noises as true as a die.

Mr. Edison says the machinery is designed for practical use by business men and lawyers, etc. He is now making a new machine which will have a plate sufficiently large to receive 500 spoken words. Thus a man may dictate half a dozen letters before leaving his office, and his clerks may write them out in his absence. If he should wish to say more, he can remove the first plate and put in a second, and so on up to any number he may require. His improvements of the airograph, he claims, will enable navigators to converse with each other during a storm at sea, while their ships are as far as three miles apart. It can also be attached to Barthôldi's statue of Liberty to be erected on Bedloe's Island.



NEW JERSEY.—EDISON'S PHONOGRAPH FOR RECORDING AND REPRODUCING SOUND.

SHEET OF TIN-FOIL ON WHICH THE SOUNDS ARE RECORDED BY EDISON'S PHONOGRAPH.

Originally appeared in Frank Leslie's Illustrated Newspaper, March 30, 1878

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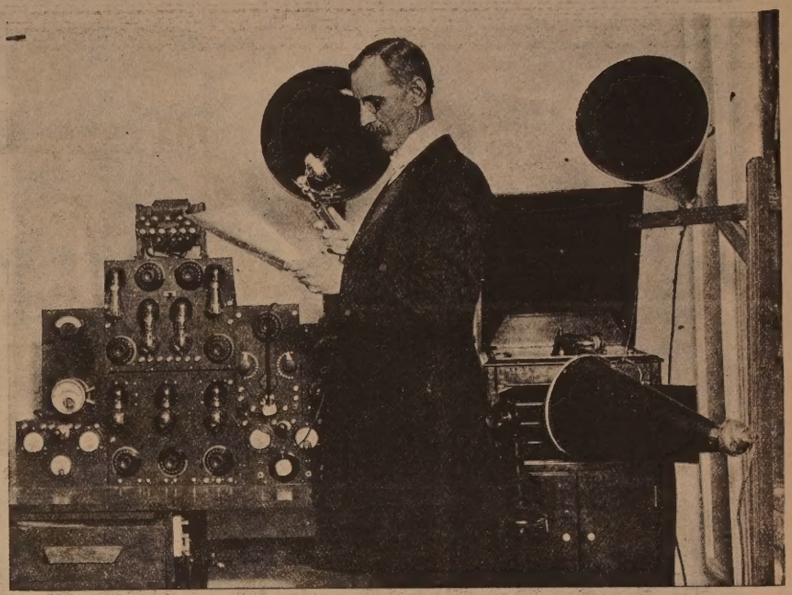

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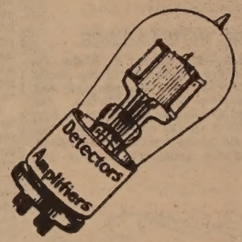

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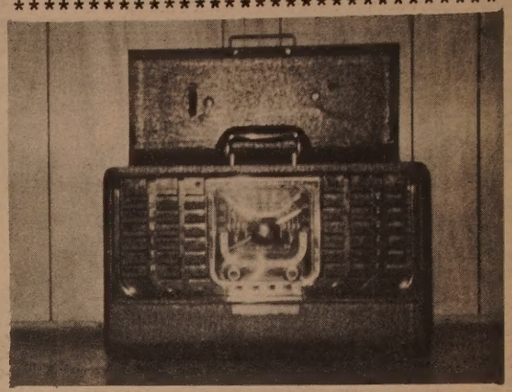

1950 ZENITH TRANS-OCEANIC portable radio; model no. 92500, chassis no. 59240. Plays good, but wavemagnet's missing. Very nice cabinet. $40.00. I'll pay U.P.S. Mike Hanke, 1036 South 15th Ave., Wausau, WI 54401.
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RADIO FICTION STORIES - i.e. Radio Boys to the Rescue by A. Chapman; Radio Boys with the Air Patrol by G. Breckenridge; and others - send your price quote - also, my want list of radio fiction available on request. Bob Grosek, 26 Holland Street, Binghamton NY 13905.

WANTED ANY OR ALL PARTS missing in photo A. K. model 60 in Kiel table -- page 63 Flick of the Switch - also 2 WD11 duds. Bill Weber, Rt. 1, Melba, ID 83641.

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WANTED: BB'S 4 TUBES or less anything pre 1922. What have you got?? Postage refunded. Ray Garner, Rt. 10, Box 645M-1, Ft. Worth, TX 76135.

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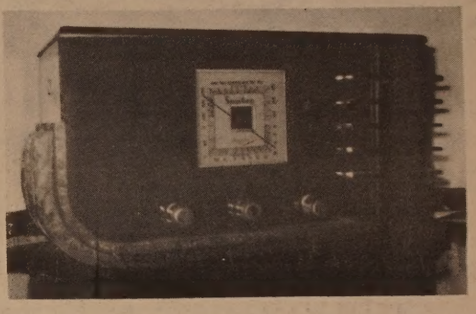

PLEASE HELP. I love mirrored glass radios. If you have one, or know where there is one, please let me know. I'm also interested in any "wild looking" radios from the 1930's like colored celluloid radios (Fada, Emerson, etc.) and chrome radios. Barbara Gorton, Box 1252, Dayton, OH 45401. (513) 253-5073.

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PUBLISHERS OF P.O. BOX 28572 DALLAS TEXAS 75228

ANTIQUE RADIO TOPICS & THE CLASSIC RADIO NEWSLETTER

LIST N/19

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ANTIQUE RADIO TUBES

ALL TUBES ARE GUARANTEED - SEE TERMS OF GUARANTEE STATED IN OUR CATALOG.

0A2	$3	1H4	$6	2A4	$8	6A5	$6	6B6	$6	6J8	$6	6SR7	$5	7B5	$6	12AH7	$5	12SN7	$4
0A3	$3	1H5	$6	2A5	$7	6A6	$5	6B7	$7	6K5	$5	6SS7	$5	7B6	$6	12AT6	$4	12SQ7	$5
0A4	$3	1H6	$6	2A6	$7	6A7	$9	6B8	$7	6K6	$5	6ST7	$5	7B7	$7	12AT7	$4	12SR7	$5
0B3	$4	1J5	$6	2A7	$6	6A8	$7	6BA6	$3	6K7	$6	6SU7	$5	7B8	$6	12AU6	$3	12SW7	$5
0C3	$4	1J6	$6	2B7	$6	6AB4	$4	6BE6	$4	6K8	$6	6SV7	$5	7C5	$5	12AU7	$3	12V6	$4
0D3	$4	1L4	$6	2E5	$10	6AB5	$12	6BJ6	$4	6L5	$6	6SZ7	$5	7C6	$8	12AV6	$4	12Z3	$4
0V4	$4	1L6	$12	2W3	$4	6AB7	$6	6C4	$4	6L6	$5	6T7	$6	7C7	$6	12AX7	$4	14A4	$6
0Z4	$5	1LA4	$7	2X2	$5	6AC5	$4	6C5	$4	6L7	$6	6T8	$5	7E6	$6	12AY7	$4	14A5	$6
1A3	$6	1LA6	$6	3A4	$5	6AC7	$6	6C6	$7	6N5	$12	6U5	$12	7E7	$6	12B7	$6	14A7	$6
1A4	$6	1LB4	$7	3A5	$5	6AD5	$7	6C7	$7	6N6	$6	6U6	$4	7F7	$12	12B8	$6	14AF7	$6
1A5	$5	1LC5	$6	3A8	$6	6AD6	$9	6C8	$6	6N7	$6	6U7	$7	7F8	$9	12BA6	$4	14B5	$6
1A6	$5	1LC6	$6	3B5	$5	6AD7	$6	6CB6	$3	6P5	$5	6V6	$3	7G7	$7	12BE6	$4	14B6	$6
1A7	$4	1LD5	$6	3B7	$5	6AE5	$5	6D4	$5	6P7	$6	6V7	$5	7H7	$6	12C5	$5	14B8	$6
1B4	$6	1LE3	$6	3C6	$6	6AE6	$6	6D6	$7	6Q7	$6	6W6	$4	7J7	$7	12C8	$6	14C5	$5
1B5	$6	1LF3	$6	3LF4	$6	6AE7	$6	6D7	$7	6R7	$6	6X4	$4	7K7	$8	12E5	$5	14C7	$6
1B7	$6	1LG5	$6	3Q4	$5	6AF5	$6	6D8	$7	6S4	$5	6X5	$4	7L7	$7	12H6	$6	14E6	$6
1C5	$4	1LH4	$6	3Q5	$5	6AF6	$9	6E5	$12	6S7	$6	6Y6	$5	7N7	$10	12J5	$6	14E7	$6
1C6	$5	1LN5	$6	3S4	$4	6AG5	$4	6E6	$5	6S8	$7	6Z4	$6	7Q7	$6	12J7	$5	14F7	$7
1C7	$6	1N5	$6	3V4	$5	6AG7	$5	6E7	$7	6SA7	$5	6Z5	$6	7R7	$6	12K7	$6	14F8	$8
1D5	$6	1N6	$6	5AZ4	$8	6AH5	$5	6E8	$7	6SB7	$6	6Z7	$6	7S7	$7	12K8	$6	14H7	$6
1D7	$6	1P5	$5	5R4	$5	6AH7	$5	6F5	$6	6SC7	$6	6ZY5	$6	7V7	$6	12L6	$4	14J7	$7
1D8	$6	1Q5	$5	5T4	$4	6AK5	$3	6F6	$6	6SD7	$5	7A4	$6	7W7	$6	12Q7	$6	14N7	$6
1E4	$5	1R4	$6	5U4	$4	6AL5	$4	6F7	$7	6SE7	$5	7A5	$5	7X6	$7	12SA7	$5	14Q7	$6
1E5	$6	1R5	$3	5V4	$5	6AL7	$9	6F8	$5	6SF5	$5	7A6	$6	7X7	$7	12SB7	$6	14R7	$6
1E7	$6	1S4	$4	5Y4	$4	6AQ5	$4	6G5	$12	6SF7	$5	7A7	$6	7Y4	$6	12SC7	$6	14W7	$6
1F4	$6	1S5	$4	5X4	$5	6AQ7	$5	6G6	$5	6SG7	$6	7A8	$6	7Z4	$6	12SF5	$5	14X7	$7
1F5	$6	1T4	$5	5Y3	$4	6AT6	$4	6H4	$5	6SH7	$5	7AD7	$6	10	$9	12SF7	$5	15	$9
1F6	$6	1T5	$5	5Y4	$5	6AT8	$3	6H6	$3	6SJ7	$5	7AE7	$6	12	$8	12SG7	$6	19	$7
1F7	$6	1U4	$5	5Z3	$5	6AU6	$3	6J4	$5	6SK7	$5	7AF7	$8	12A5	$6	12SH7	$5	19T8	$3
1G4	$6	1U5	$5	5Z4	$5	6AV6	$4	6J5	$6	6SL7	$5	7AG7	$6	12A6	$6	12SJ7	$5	20	$9
1G5	$6	1V	$6	6A3	$6	6B4	$6	6J6	$3	6SN7	$3	7AH7	$6	12A7	$7	12SK7	$5	22	$8
1G6	$6	2A3	$10	6A4	$7	6B5	$7	6J7	$6	6SQ7	$5	7B4	$6	12A8	$6	12SL7	$5	24A	$7

25A6	$6	36	$8	59	$9	1201	$6	5654	$6	6AS5	$6	6CG7	$6	6DT6	$6	6GH8	$6	6SA7	$6
25A7	$6	37	$6	70A7	$7	1203	$6	5670	$6	6AS6	$6	6CG8	$6	6DT8	$6	6GJ7	$6	6SB7	$6
25AC5	$6	38	$6	70L7	$8	1231	$6	5687	$6	6AS7	$6	6CG9	$6	6DX8	$6	6GK5	$6	6SC7	$6
25B6	$6	39	$6	71A	$9	1232	$7	5691	$6	6AT6	$4	6CH6	$6	6E5	$12	6GK6	$6	6SD7	$5
25C6	$6	40	$9	75	$8	1273	$6	5692	$6	6AT8	$3	6CK4	$6	6E6	$5	6GM6	$6	6SF5	$5
25L6	$6	4025	$5	76	$5	1274	$6	5693	$6	6AU4	$6	6CL6	$6	6E7	$7	6GN8	$6	6SF7	$5
25Z5	$6	41	$6	77	$7	1282	$6	5696	$6	6AU5	$6	6CM6	$6	6E8	$7	6GS7	$6	6SG7	$6
25Z6	$6	42	$6	78	$8	1291	$6	5702	$6	6AU6	$3	6CM7	$6	6EA8	$6	6GU7	$6	6SH7	$5
26A6	$6	43	$7	79	$6	1294	$6	5703	$6	6AV6	$4	6CN6	$6	6EB8	$6	6GV8	$6	6SJ7	$5
26A7	$6	44	$6	80	$5	1629	$9	5718	$6	6AW6	$6	6CQ6	$6	6EH7	$6	6GW8	$6	6SK7	$5
26A6	$6	45	$10	81	$9	1852	$6	5725	$6	6AX4	$6	6CS6	$6	6EJ7	$6	6GX8	$6	6SL7	$5
26A7	$6	4523	$5	82	$7	1853	$6	5726	$6	6AX5	$6	6CU6	$6	6EM7	$6	6H4	$5	6SN7	$3
27	$7	4525	$4	83	$7	5881	$7	5749	$6	6B4	$6	6CW4	$6	6EQ7	$6	6H6	$3	6SQ7	$5
28D7	$4	46	$6	83V	$7	6146	$7	5750	$6	6B5	$7	6CX8	$6	6ES8	$6	6HA5	$6	6SR7	$5
30	$7	47	$9	84	$6	9001	$5	5751	$6	6B6	$6	6D4	$5	6EW6	$6	6HG8	$6	6SS7	$5
31	$6	48	$8	85	$6	9002	$5	5814	$6	6B7	$7	6D6	$7	6F5	$6	6HM5	$6	6ST7	$5
32	$6	49	$8	89	$6	9003	$5	5840	$6	6B8	$7	6D7	$7	6F6	$6	6HS6	$6	6SU7	$5
34	$6	50	$9	117L7	$9	9006	$6	5842	$6	6BA6	$3	6D8	$7	6F7	$7	6HU8	$6	6T8	$5
35	$7	50A5	$6	117M7	$9	VR75	$4	5844	$6	6BE6	$4	6DA4	$6	6F8	$5	6J5	$6	6TA7	$6
35A5	$6	50B5	$4	117N7	$8	VR90	$4	5847	$6	6BH6	$4	6DE6	$6	6G5	$12	6J6	$3	6TB4	$6
35B5	$6	50C5	$3	117P7	$8	VR105	$4	5879	$6	6BJ6	$4	6DE7	$6	6G6	$5	6J7	$6	6TC8	$6
35C5	$4	50L6	$6	117Z3	$6	VR150	$4	5881	$6	6BK7	$6	6DK6	$6	6G7	$7	6J8	$6	6TD7	$6
35L6	$5	50X6	$6	117Z6	$6	VT-52	$7	5886	$6	6BL7	$6	6DL7	$6	6G8	$7	6JE8	$6	6TE8	$6
35W4	$5	50Y6	$6	485	$7	FM1000	$9	5963	$6	6BN6	$6	6DN6	$6	6GH5	$6	6JH8	$6	6TF8	$6
35Y4	$6	50Y7	$6	717A	$9	XXD	$6	5965	$6	6BQ5	$6	6DQ6	$6	6GH7	$6	6JS8	$6	6TG8	$6
35Z3	$5	51	$7	879	$5	XXL	$6	6005	$6	6BQ6	$6	6DR7	$6	6GH8	$6	6JU8	$6	6TH8	$6
35Z4	$6	53	$15	884	$8	XXFM	$7	6021	$6	6BQ7	$6	6DS6	$6	6GJ7	$6	6K7	$6	6TM7	$6
35Z5	$5	55	$8	950	$8			6080	$6	6BR7	$6	6DS7	$6	6GK5	$6	6K8	$6	6TN7	$6
35Z6	$6	56	$6	951	$8			6146	$7	6BS7	$6	6DT5	$6	6GK6	$6	6L6	$5	6TP7	$6
35Z5	$5	57	$7	955	$7			6197	$6	6BZ6	$6	6DT6	$6	6GM6	$6	6L7	$6	6TR7	$6
35Z6	$6	58	$8	958	$7			6201	$6	6CB6	$3	6DT6	$6	6GN8	$6	6N7	$6	6TS7	$6

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